

HOPING FOR A LARGE FISH SAMPLE

APPENDIX A

**EFFLUENT ON-SITE AND OFF-SITE MONITORING
PROGRAM**

1989 EFFLUENT ON-SITE AND OFF-SITE MONITORING PROGRAM

The following schedule represents the West Valley Demonstration Project's routine environmental monitoring program which was in place in 1989. This schedule meets or exceeds the minimum program needed to satisfy the requirements of the Department of Energy (DOE) Order 5400.1, which superseded DOE 5484.1A, Chapter III, in late 1988. It also meets requirements of further DOE 5400 orders currently being drafted. Specific methods and recommended monitoring program elements are found in DOE/EP-0096, "Effluent Monitoring," and DOE/EP-0023, "Environmental Surveillance," which are the bases for selecting most of the schedule specifics. Additional monitoring is mandated by Operational Safety Requirements (OSRs) and air and water discharge permits (40 CFR 61 and SPDES), which also require a formal report. These specific cases are identified in the schedule under MONITORING/REPORTING REQUIREMENTS. The overall environmental program schedule is referenced in OSR/TR-GP-4.

Summary of Monitoring Program Changes Implemented in 1989

Significant 1989 program changes were limited to collecting samples from new sample points and to changes in frequency of sampling and analyses, in response to changes in regulations coming into effect in late 1988 and in 1989.

Schedule of Environmental Sampling

The following table is a schedule of environmental sampling at the West Valley Demonstration Project. Locations of the sampling points are shown in Figures A-1 through A-9. The index below is a list of the codes for the various sample locations. Table headings in the schedule are as follows:

- **Sample Location and ID code.** *The physical location from which the sample is collected is described. The ID is a seven-character code: The first character identifies the sample medium as Air, Water, Soil/Sediment, Biological, or Direct Measurement. The second character specifies on-site or off-site location. The remaining characters describe the specific location (e.g., AFGRVAL is Air, off-site, at Great Valley).*
- **Monitoring/Reporting Requirements.** *The basis for monitoring that location and any additional references to permits or OSRs are noted, as well as the reports generated from the sample data.*
- **Sampling Type/Medium.** *This describes the collection method and the physical characteristics of the medium.*
- **Collection Frequency.** *Indicates how often the samples are collected or retrieved.*
- **Total Annual Samples.** *The number of discrete physical samples collected annually, not including composites of collected samples, is noted.*
- **Analysis Performed/Composite Frequency.** *The individual analyses of the samples or composites of samples and the frequency of analyses is described.*

Index of Environmental Monitoring Program Sample Points

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* Not detailed on map

Index of Environmental Monitoring Program Sample Points

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* Not detailed on map

1989 EFFLUENT AND ON-SITE MONITORING PROGRAM

<u>SAMPLE LOCATION AND I.D. CODE</u>	<u>MONITORING/REPORTING REQUIREMENTS</u>	<u>SAMPLING TYPE/MEDIUM</u>	<u>COLLECTION FREQUENCY</u>	<u>TOTAL ANNUAL SAMPLES</u>	<u>ANALYSES PERFORMED/ COMPOSITE FREQUENCY</u>
Main Plant Ventilation Exhaust Stack ANSTACK	Airborne radioactive effluent point including LWTs and Vitrification Off- Gas	Continuous off- line air particulate monitor	Continuous measurement of fixed filter, replaced weekly	N/A	Real time alpha and beta monitoring
Supernatant Treatment System (STS) Ventilation Exhaust ANSTSTK	<u>Required by:</u> OSR/TR-GP-1 40 CFR 61	Continuous off- line air particulate filter	Weekly	104 (52 per location)	Gross alpha/beta, gamma isotopic.* Quarterly composite for Sr-90, Pu/L isotopic, Am-241, gamma isotopic
	<u>Reported:</u> Monthly Environmental Monitoring Trend Analysis	Continuous off- line desiccant column for water vapor collection	Weekly	104 (52 per location)	H-3
	Annual Effluent and On-Site Discharge Report	Continuous off- line charcoal cartridge	Weekly	104 (52 composited to 4 per location)	Quarterly composite for I-129
	Annual Environmental Monitoring Report Air Emission Annual Report (NESHAP)				

Weekly gamma isotopic only if gross activity rises significantly

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Cement Solidification System (CSS) Ventilation Exhaust ANCSSTK	Airborne radioactive effluent point <u>Required by:</u> OSR/TR-GP-1 40 CFR 61	Continuous off- line air particulate monitor	Continuous measurement of fixed filter, replaced weekly	N/A	Real time alpha and beta monitoring
Contact Size Reduction Facility Exhaust ANCSRFK	<u>Reported:</u> Monthly Environmental Monitoring Trend Analysis Annual Effluent and On-site Discharge report Annual Environmental Monitoring Report Air Emissions Annual Report (NESHAP)	Continuous off- line air particulate filter Continuous off- line charcoal cartridge.	Weekly Weekly	104 (52 per location) 104 (52 composited to 4 per location)	Gross alpha/beta, gamma isotopic.* Quarterly composite for Sr-90, Pu/U isotopic, Am-241, gamma isotopic. Quarterly composite for I-129

*Weekly gamma isotopic only if gross activity rises significantly.

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Supercompactor Exhaust ANSUPCV	<p>Airborne radioactive effluent point</p> <p><u>Required by:</u> OSR/TR-GP-1 40 CFR 61</p> <p><u>Reported:</u> Monthly Environmental Monitoring Trend Analysis</p> <p>Annual Effluent and On-site Discharge Report</p> <p>Annual Environmental Monitoring Report</p> <p>Air Emissions Annual Report (NESHAP)</p>	Continuous off- line air particulate monitor during operation (maximum of 26 operating weeks expected)	Continuous measurement of fixed filter, collected and replaced every seven operating days, or at least monthly when unit is operated	<p>N/A</p> <p>26</p> <p>26 composited to 4</p>	<p>Real time beta monitoring</p> <p>Filters for gross alpha/beta, gamma isotopic* upon collection</p> <p>Quarterly composites: filters for Sr-90, Pu/U isotopic, Am-241, gamma isotopic</p>

Weekly gamma isotopic only if gross activity rises significantly.

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Lagoon 3 Discharge Weir WNSP001	Primary point of liquid effluent batch release	Grab liquid	Daily, during Lagoon 3 discharge	40-80	Daily: gross beta, conductivity, pH. Every sixth daily sample: gross alpha/beta, H-3, Sr-90, gamma isotopic. Weighted monthly composite of daily samples: gross alpha/beta, H-3, C-14, Sr-90, I-129, gamma isotopic, Pu/U isotopic, Am-241
	<u>Required by:</u> OSR/TR-GP-2 SPDES Permit				
	<u>Reported:</u> Monthly NPDES DMR				
	Annual Effluent and On-site Discharge Report	Composite liquid	Twice during discharge, near start, and near end	8-10	Two 24 hour composites for Al, NH ₃ , As, BOD-5, Fe, Zn, pH, suspended solids; SO ₄ , NO ₃ , NO ₂ , Cr ⁺⁶ , Cd, Cu, Pb
	Annual Environmental Monitoring Report	Grab liquid	Twice during discharge, same as composite	8-10	Settleable solids, pH, cyanide, oil and grease
		Composite liquid	Annually	1	Annually, a 24 hour composite for: Cr, Ni, Se, Ba, Sb
		Grab liquid	Annually	1	Chloroform

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Erdman Brook at Security Fence UNSP006	Combined facility liquid discharge <u>Required by:</u> OSR/TR-GP-2 <u>Reported:</u> Monthly Environmental Monitoring Trend Analysis Annual Environmental Monitoring Report	Continuous proportional sample liquid	*Weekly	52	Gross alpha/beta, H-3, pH, conductivity. Monthly composite: gamma isotopic and Sr-90. Quarterly composite: C-14, I-129, Pu/U isotopic, Am-241.
Sanitary Waste Discharge UNSP007	Liquid effluent point for sanitary and utility plant combined discharge <u>Required by:</u> SPDES Permit <u>Reported:</u> Monthly NPDES DMR Monthly Environmental Monitoring Trend Analysis Annual Effluent and On-site Discharge Report Annual Environmental Monitoring Report	24 hour composite liquid Grab liquid Grab liquid In-line monitor with alarm	3/month Weekly Annually Continuous	36 52 1 N/A	Gross alpha/beta, H-3, suspended solids, NH ₃ , BOD-5, Fe pH, settleable solids Chloroform pH

*Samples were collected simultaneously for NYSDOH.

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N.E. Swamp Drainage WNSWAMP*	Site surface drainage	Grab liquid	Monthly	24 (12 per location)	Gross alpha/beta, H-3, pH
North Swamp Drainage WNSW74A	<u>Reported:</u> Annual Effluent and On-site Discharge Report				
French Drain WNSP008	Drains subsurface water from LLWT Lagoon area	Grab liquid	3/month	36	pH, conductivity, BOD-5, Fe
	<u>Required by:</u> SPDES Permit		Monthly	12	Gross alpha/beta, H-3
	<u>Reported:</u> Monthly NPDES DMR		Annually	1	Ag,Zn
	Annual Effluent and On-Site Discharge Report				
	Annual Environmental Monitoring Report				

*Samples collected simultaneously for NYSDOH.

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Condensate and Cooling Water Ditch WNSP005	Combined drainage from facility yard area <u>Reported:</u> Internal Review	Grab liquid	Monthly	12	Gross alpha/beta, H-3, pH
Cooling Tower Basin WNCOOLW	Cools plant utility steam system water <u>Reported:</u> Internal Review	Grab liquid	Monthly	12	Gross alpha/beta, H-3, pH
Site Potable Water WINDRNKW	Source of water within site perimeter <u>Reported:</u> Internal Review	Grab liquid	Monthly Annually	12 2	Gross alpha/beta, H-3, pH, conductivity Toxic metals, pesticides chemical pollutants
SDA Holding Lagoon WNSP003	State Disposal Area Holding Lagoon <u>Reported:</u> Annual Environmental Monitoring Report NYSERDA	Grab liquid	Annually (as required)	1	Gross alpha/beta, H-3, C-14, pH, gamma isotopic, Sr-90, I-129, Pu/U isotopic

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Frank's Creek E of SDA WNFRC67	Drains NYS Low-Level Waste Disposal Area <u>Reported:</u> Internal review NYSERDA	Grab liquid	*Monthly	12	Gross alpha/beta, H-3, pH
Erdman Brook N of Disposal Areas WNERB53	Drains NYS and WVDP disposal areas <u>Reported:</u> Internal review NYSERDA	Grab liquid	Weekly *Monthly	52	Gross alpha/beta, H-3, pH
Ditch N of WVDP NDA & SDA WNNDADR	Drains WVDP disposal and storage area <u>Reported:</u> Internal review Environmental Monitoring Trend Analysis	Composite continuous liquid	Weekly	52	pH Monthly composite: gross alpha/beta, gamma isotopic, H-3. Quarterly composite: Sr-90, I-129
Drainage S of Drum Cell WNDCELD	<u>Reported:</u> Internal review	Grab liquid	Weekly	52	pH Monthly composite: gross alpha/beta, gamma isotopic, H-3. Quarterly composite: Sr-90, I-129

*Samples were collected simultaneously for NYSDOH.

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On-site Standing Water (ponds not receiving effluent)	Water within vicinity of plant airborne or ground water effluent <u>Reported:</u> Internal Review	Grab liquid	Annually	7-10*	Gross alpha/beta, H-3, pH, conductivity, chloride, Fe, Mn, Na, phenols, sulfate
Test Pit N of HLW Area UNSTAW1					
Slough SW of RTS Drum Cell UNSTAW2					
Pond SE of Heinz Road UNSTAW3					
Border Pond S of AFRT240 UNSTAW4					
Border Pond SW of DFTLD13 UNSTAW5					
Borrow Pit NE of Project Facilities UNSTAW6					
Pond SW of Project Facilities W of Rock Springs Road UNSTAW7					
Slough N of Quarry Creek UNSTAW8					
North Reservoir Near Intake UNSTAW9					
Background Pond at Sprague Brook Maintenance Building UNSTAWB					

Number of points sampled will depend upon on-site ponding conditions during the year.

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On-site Ground- water	Groundwater monitoring wells around site solid waste management units	Grab liquid	4 times semiannually (8 samples yearly per well)**	144	Gross alpha/beta, H-3, gamma isotopic, chloride, sulfate, phenols, F, nitrate, TOC, TOH, As, Ba, Cs, Cr, Fe, Pb, Mn, Hg, Se, Ag, Na
HLW Tank GW Monitoring Unit - Wells: WNW 80-2 86-7 86-8 86-9 86-12* Surface: WNMPNE*	<u>Reported:</u> Annual Environmental Monitoring Report	Direct measurement of sample discharge water	Before and after grab sample collection	288 (2 measurements per sample collection event)	Temperature, pH, conductivity
Lagoon GW Monitoring Unit - Wells: WNW 86-6 86-3 86-4 86-5 80-5 80-6 Surface: WNGSEEP WNSP008					
NDA GW Monitoring Unit - Wells: WNW 83-1D 86-10 86-11 82-1D					

*Serves former Cold Dump

**Sampling and analysis conducted as outlined in the RCRA Groundwater Technical Enforcement Guidance Document (EPA OSWER 9950.1) at the Statistical Analysis of Monitoring Data at RCRA Facilities (EPA/530-SW-89-026).

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On-site Ground- water	Groundwater monitoring wells around site facilities	Grab liquid	Semiannually	22* (2 per location)	Gross alpha/beta, H-3, gamma isotopic
Facility/Plant Area Wells: <u>WNW</u> 80-3 80-4	<u>Reported:</u> Annual Environmental Monitoring Report	Direct measurement of sample discharge water	Before and after grab sample collection	44* (two measurements per sample collection event)	Temperature, pH, conductivity
NDA Area Wells: <u>WNW</u> 82-1A 82-1B 82-1C 82-2B 82-2C 82-3A 82-4A1 82-4A2 82-4A3					
Fuel Storage Tank Subsurface Monitoring Well: <u>WNW</u> 86-13	<u>Reported:</u> Annual Environmental Monitoring Report	Grab liquid	Semiannually	2	Gross alpha/beta, H-3, gamma isotopic, phenols, TOC, benzene, toluene, xylene
		Direct measurement of discharge water	Before and after grab sample collection	4	Temperature, pH, conductivity

*Number of samples variable; occasionally wells are dry.

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Cattaraugus Creek at Felton Bridge WFFELBR	Unrestricted surface waters receiving plant effluents <u>Reported:</u> Monthly Environmental Monitoring Trend Analysis Annual Environmental Monitoring Report	Flow weighted continuous liquid	Weekly *Weekly for monthly composite	52	Gross alpha/beta, H-3, pH. Monthly composite for gamma isotopic and Sr-90
Buttermilk Creek, Upstream of Cattaraugus Creek Confluence at Thomas Corners Road WFBCTCB	Restricted surface waters receiving plant effluents <u>Reported:</u> Annual Environmental Monitoring Report	Composite continuous liquid	*Biweekly	26	Monthly for gross alpha/beta, H-3, pH. Quarterly composite for gamma isotopic and Sr-90
Buttermilk Creek near Fox Valley WFBCKG	Restricted surface water background <u>Reported:</u> Monthly Environmental Monitoring Trend Analysis Annual Environmental Monitoring Report	Composite continuous liquid	*Biweekly	26	Monthly for gross alpha/beta, H-3. Quarterly composite for gamma isotopic and Sr-90

*Samples are split with NYSDOH.

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Wells near WVDP outside WNYNSC Perimeter	Drinking supply groundwater near facility	Grab liquid	Biennially (Background well sampled annually)	6 (5 + background well each year of collection)*	Gross alpha/beta, H-3, gamma isotopic, pH, conductivity
3.0 km WNW WFWEL01	Reported: Annual Environmental Monitoring Report				
1.5 km NW WFWEL02					
4.0 km NW WFWEL03					
3.0 km NW WFWEL04					
2.5 km SW WFWEL05					
29 km S WFWEL06 (background)					
4.0 km NNE WFWEL07					
2.5 km ENE WFWEL08					
3.0 km SE WFWEL09					
7.0 km N WFWEL10					

*In 1989 all 10 wells were sampled.

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3.0 km SSE at Fox Valley AFFXVRD	Particulate air samples around WNYNSC perimeter	Continuous air particulate filter	Weekly	468 (52 per location)	Gross alpha/beta
3.7 km NNW at Thomas Corners Road AFTCORD	<u>Reported:</u> Annual Environmental Report				Quarterly composite for Sr-90, gamma isotopic
2.0 km NE on Route 240 AFRT240+	Monthly Environmental Monitoring Trend Analysis (four sites only+)	Continuous desiccant column for water vapor collection	Weekly (2 sites only**)	104 (52 per site)	H-3
1.5 km NW on Rock Springs Road AFRSPRD**+		Continuous charcoal cartridge	Weekly (2 sites only**)	104 (52 per site)	Quarterly composite for I-129
29 km S at Great Valley (background) AFGRVAL***+					
7 km N at Springville AFSPRVL					
6 km SSE at West Valley AFWEVAL					
50 km W at Dunkirk (background) AFDNKRK					
2.3 km SW on Dutch Hill Road AFBOEHN+					

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2.5 km SW AFDNFOP	Collection of fallout particulate and precipitation around WNYNSC perimeter <u>Reported:</u> Annual Environmental Report	Integrating liquid	Monthly	48 (12 per site)	Gross alpha/beta, H-3, pH
3.0 km SSE AFFXFOP					
3.7 km NNW AFTCFOP					
2.0 km NE AF24FOP					
Surface Soil (at each of nine air samplers plus 26 km SSW at Little Valley) SFSOL - Series	Long-term fallout accumulation <u>Reported:</u> Annual Environmental Monitoring Report (year of collection)	Surface plug composite soil	Annually	10	Gamma isotopic, Sr-90, Pu-239, Am-241
Buttermilk Creek at Thomas Corners Road SFTCSED**	Deposition in sediment downstream of facility effluents	Grab stream sediment	Semiannually 1st sample of SFBCSED and SFSDSED each spring*	10	Gross alpha/beta, isotopic gamma and Sr-90
Buttermilk Creek at Fox Valley Road (background) SFBCESED**	<u>Reported:</u> Annual Environmental Monitoring Report		Annually (2 sites only**)	2	U/Pu isotopic, Am-241
Cattaraugus Creek at Springville Dam SFSDSED					
Cattaraugus Creek at Bigelow Bridge (background) SFBISED					
Cattaraugus Creek at Felton Bridge SFCCSED					

*Sample to be split with NYSDOH.

**Analysis on one of two semiannual collections.

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Cattaraugus Creek downstream of the Buttermilk Creek Confluence BFFCATC	Fish in waters downstream of facility effluents <u>Reported:</u> Annual Environmental Monitoring Report	Individual collection, biological	Semiannually *BFFCATC and BFFCTRL shared with NYSDOH, BFFCATD as sample is available	6 (each sample is 10 fish)	Isotopic gamma and Sr-90 in edible portions of each individual fish
Cattaraugus Creek downstream of Springville Dam BFFCATD					
Control Sample from nearby stream not affected by WVDP (7 km or more upstream of site effluent point) BFFCTRL					
Dairy Farm, 3.8 km NNW BFMREED	Milk from animals foraging around facility perimeter	Grab biological	Monthly (*BFMREED, BFMCOBO, BFMCTLS, BFMCTLN)	48 (12 per site)	Gamma isotopic, Sr-90, H-3 and I-129 on annual samples and quarterly composites of monthly samples
Dairy Farm, 1.9 km WNW BFMCOBO	<u>Reported:</u> Annual Environmental Monitoring Report				
Dairy Farm, 3.5 km SE of site BFMWIDR			Annual (BFMWIDR, BFMHAUR)	2	
Dairy Farm 2.5 km SSW BFMHAUR					
Control location 25 km S BFMCTLS					
Control location 30 km N BFMCTLN					

*Samples shared with NYSDOH

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<u>SAMPLE LOCATION AND I.D. CODE</u>	<u>MONITORING/REPORTING REQUIREMENTS</u>	<u>SAMPLING TYPE/MEDIUM</u>	<u>COLLECTION FREQUENCY</u>	<u>TOTAL ANNUAL SAMPLES</u>	<u>ANALYSES PERFORMED/ COMPOSITE FREQUENCY</u>
(3) Nearby locations BFVNEAR	Fruit and vegetables grown near facility perimeter downwind if possible	Grab biological	*Annually, at harvest	6	Gamma isotopic and Sr-90 analysis of edible portions, H-3 in free moisture
(3) Remote locations (16 km or more from facility) BFVCTRL	<u>Reported:</u> Annual Environmental Monitoring Report				
Beef cattle forage from near site location N BFHNEAR		Grab biological	Annually	2	Gamma isotopic, Sr-90
Milk cow forage from control south location or north location BFHCTLS or BFHCTLN					
Beef animal from nearby farm in downwind direction BFBNEAR	Meat-beef foraging near facility perimeter, downwind if possible	Grab biological	Semiannually *2nd sample (each fall) to NYSDOH	4	Gamma isotopic and Sr-90 analysis of meat
Beef animal from control location (16 km or more from facility) BFBCTRL	<u>Reported:</u> Annual Environmental Monitoring Report				
In vicinity of the site (3) BFDNEAR	Meat-deer foraging near facility perimeter	Individual collection biological	*Annually, during hunting season	3	Gamma isotopic and Sr-90 analysis of meat
Control animals (3) (16 km or more from facility) BFDCTRL	<u>Reported:</u> Annual Environmental Monitoring Report		*During year as available	3	

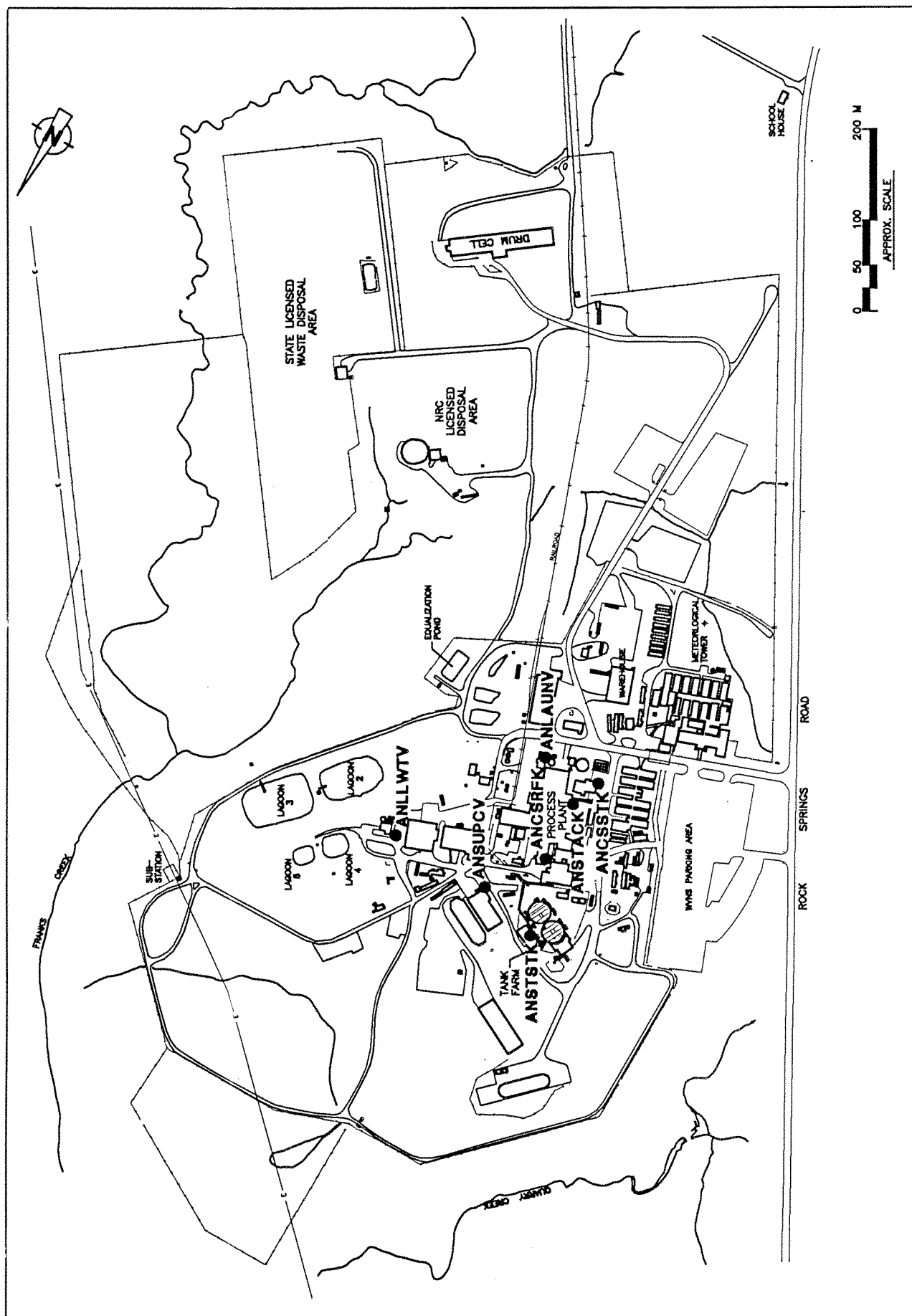
*Sample to be split with NYSDOH

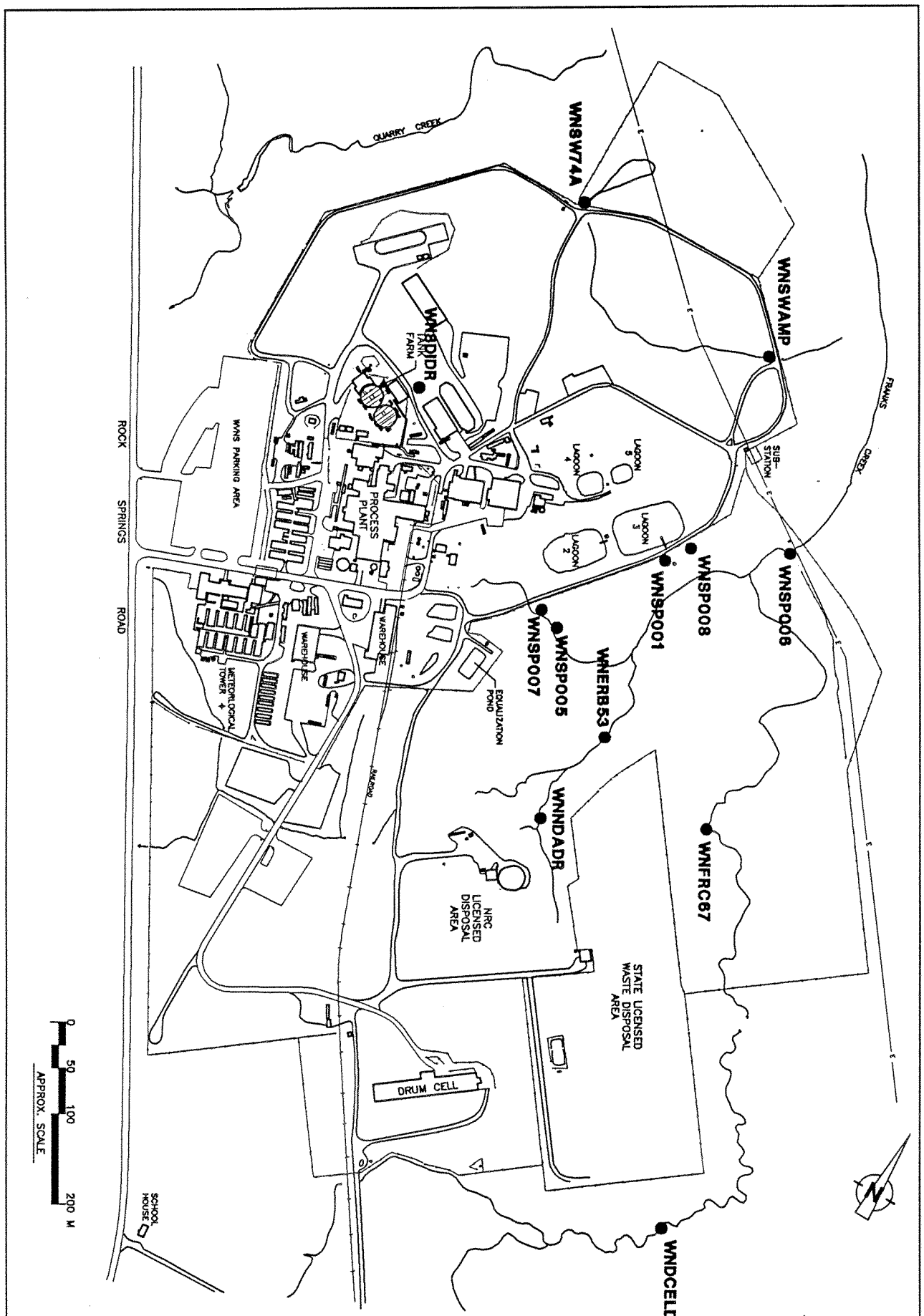
1989 OFF-SITE MONITORING PROGRAM

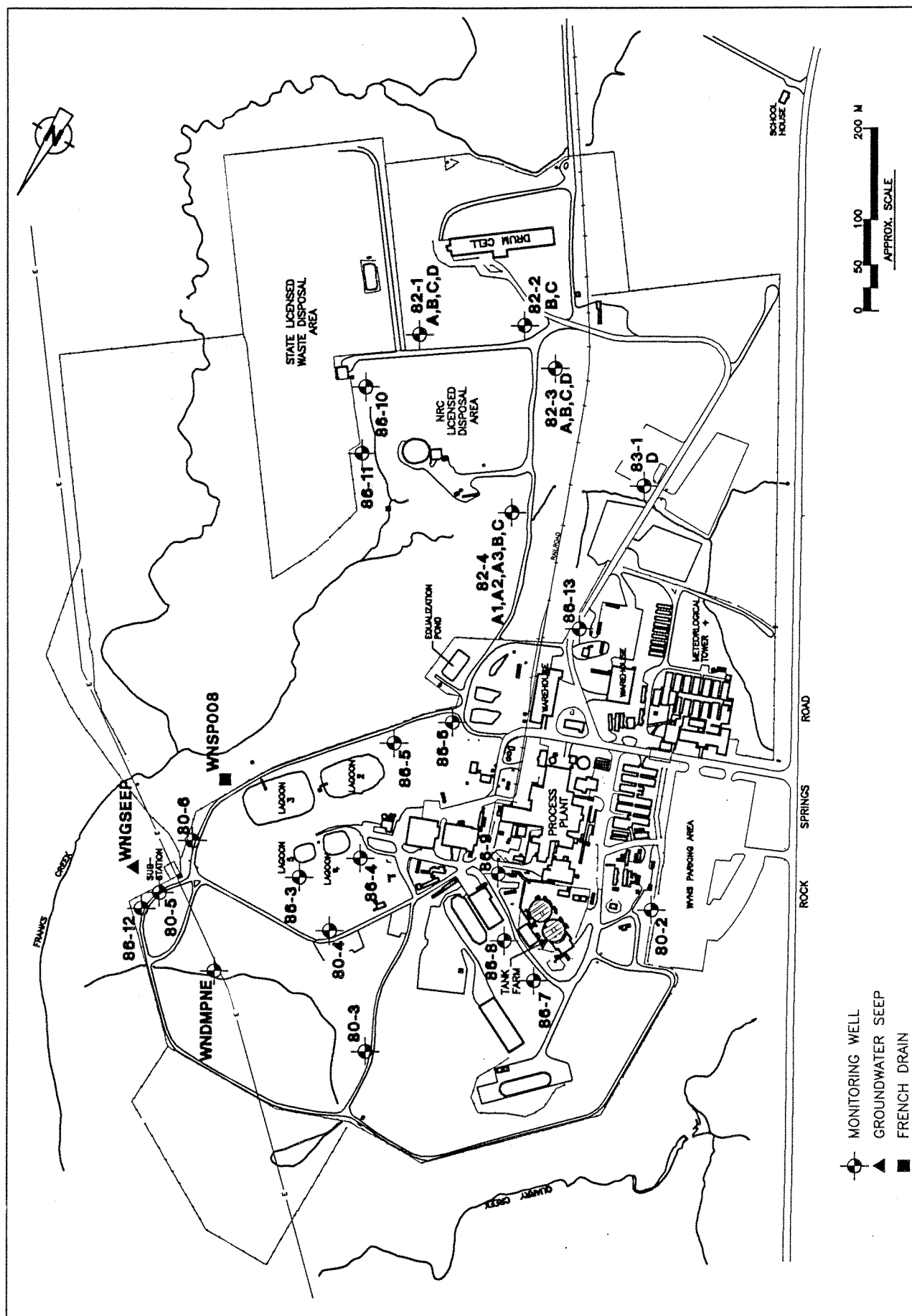
<u>SAMPLE LOCATION AND I.D. CODE</u>	<u>MONITORING/REPORTING REQUIREMENTS</u>	<u>SAMPLING TYPE/MEDIUM</u>	<u>COLLECTION FREQUENCY</u>	<u>TOTAL ANNUAL SAMPLES</u>	<u>ANALYSES PERFORMED/ COMPOSITE FREQUENCY</u>
Thermolumines- cent Dosimetry (TLD) off-site: DFTLD Series	Direct radiation around facility	Integrating LiF TLD	Quarterly	460 (5 TLD's at each of 23 locations, collected 4 times per year)	Quarterly gamma radiation exposure
(16) at each of 16 compass sectors, at nearest accessible perimeter point #1-16	<u>Reported:</u> Monthly Environmental Monitoring Trend Analysis Annual Environmental Monitoring Report				
"5 Points" land-fill, 19 km SW (background) #17					
1500 m NW (downwind receptor) #20					
Springville 7 km N #21					
West Valley 5 km SSE #22					
Great Valley, 29 km S (background) #23					
Dunkirk, 50 km NW (background) #37					
Sardinia-Savage Rd. 24 km NE (background) #41					

1989 EFFLUENT AND ON-SITE MONITORING PROGRAM

<u>SAMPLE LOCATION AND I.D. CODE</u>	<u>MONITORING/REPORTING REQUIREMENTS</u>	<u>SAMPLING TYPE/MEDIUM</u>	<u>COLLECTION FREQUENCY</u>	<u>TOTAL ANNUAL SAMPLES</u>	<u>ANALYSES PERFORMED/ COMPOSITE FREQUENCY</u>
Thermoluminescent Dosimetry (TLD) on-site: DNTLD Series	Direct radiation on facility grounds	Integrating LiF TLD	Quarterly	360 (5 TLD's at each of 18 sites collected 4 times per year)	Quarterly gamma radiation exposure
(3) at corners of SDA #18, 19, 33	<u>Reported:</u> Monthly Environmental Monitoring Trend Analysis				
(9) at security fence around site #24, 26-34	Annual Environmental Monitoring Report				
(5) On-site near operational areas #35, 36, 38-40					
Rock Springs Road 500 m NNW of plant #25					







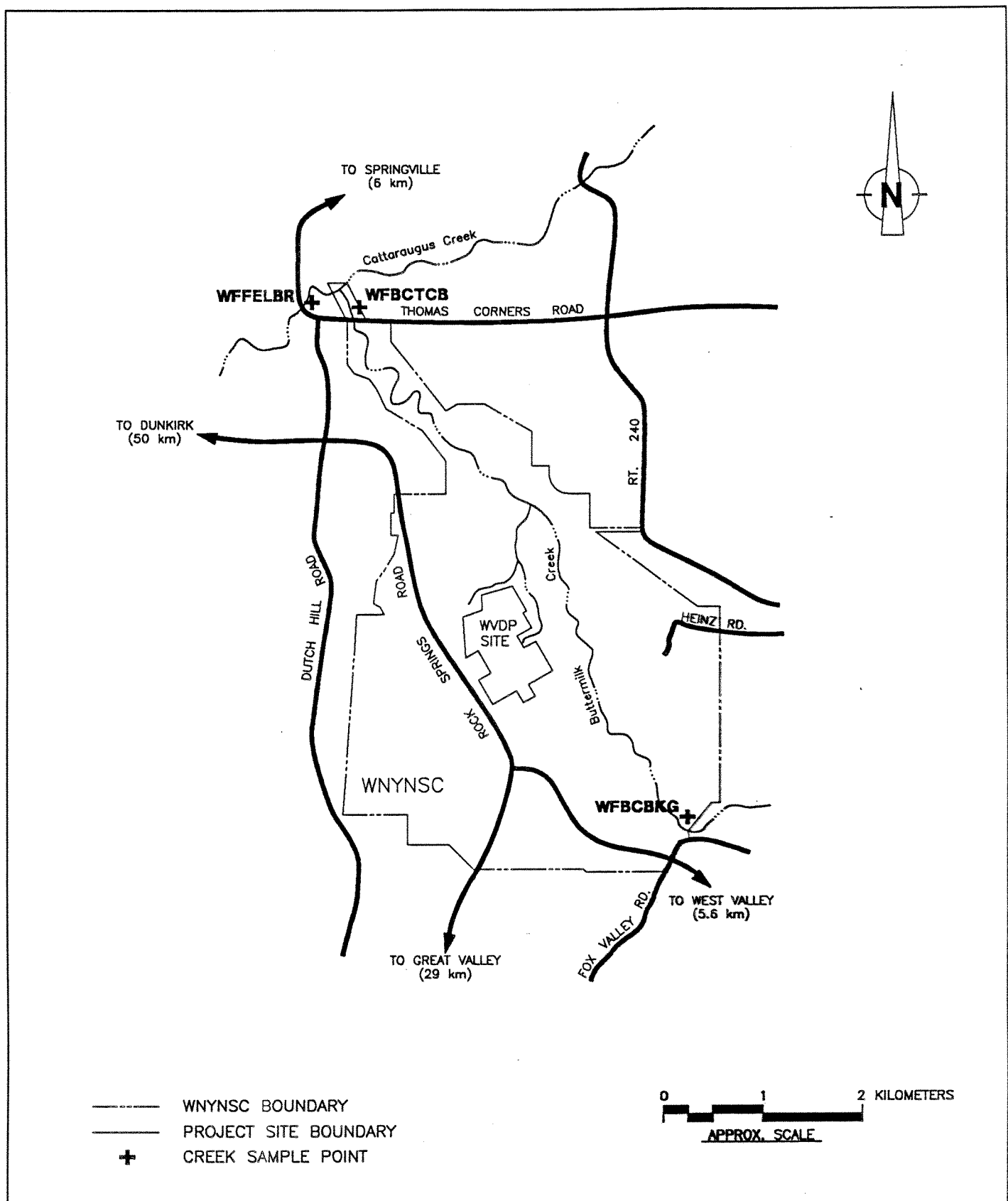


Figure A-4. Location of Off-Site Surface Water Samplers.

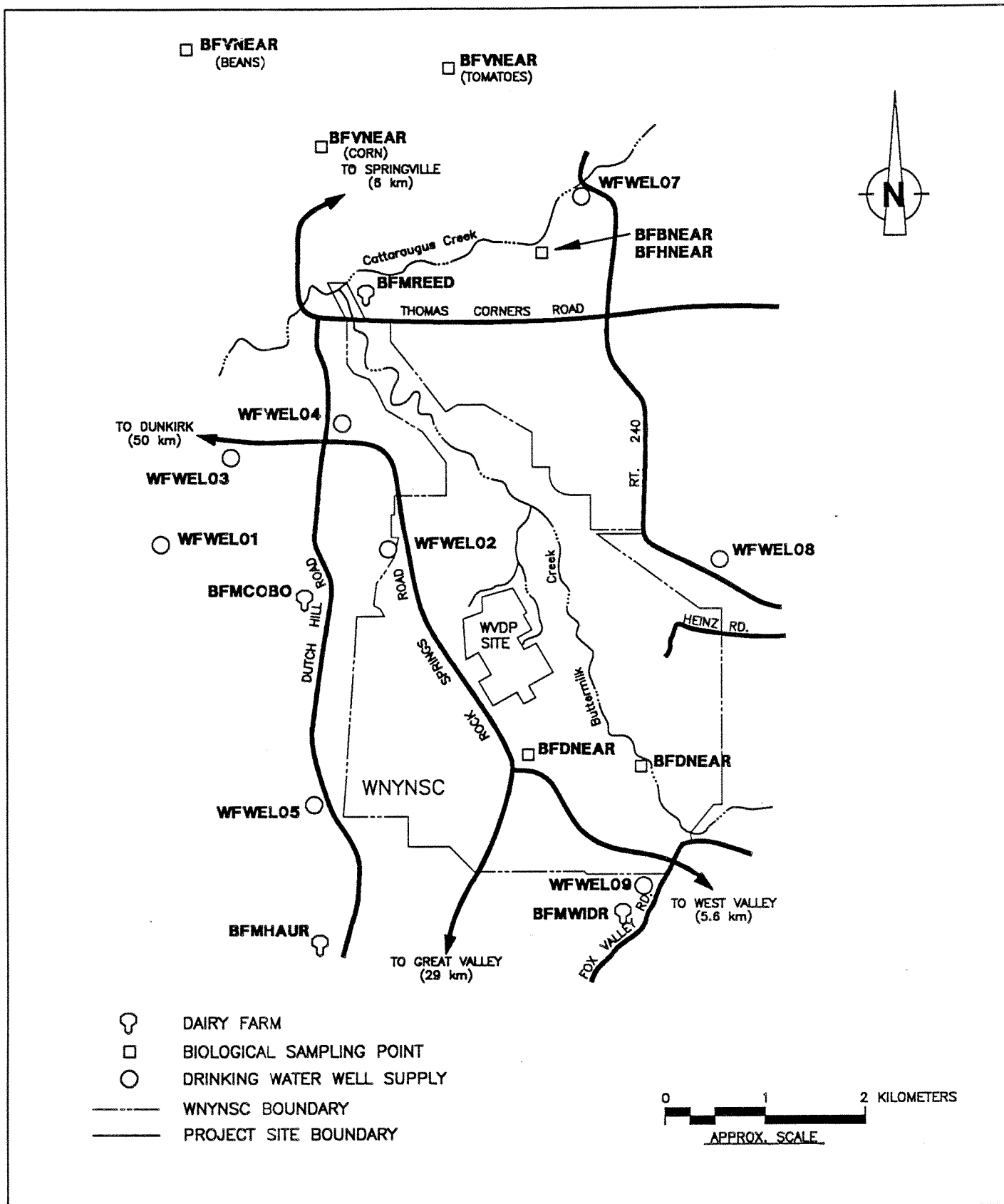


Figure A-5. Near-Site Drinking Water and Biological Sample Points — 1989.

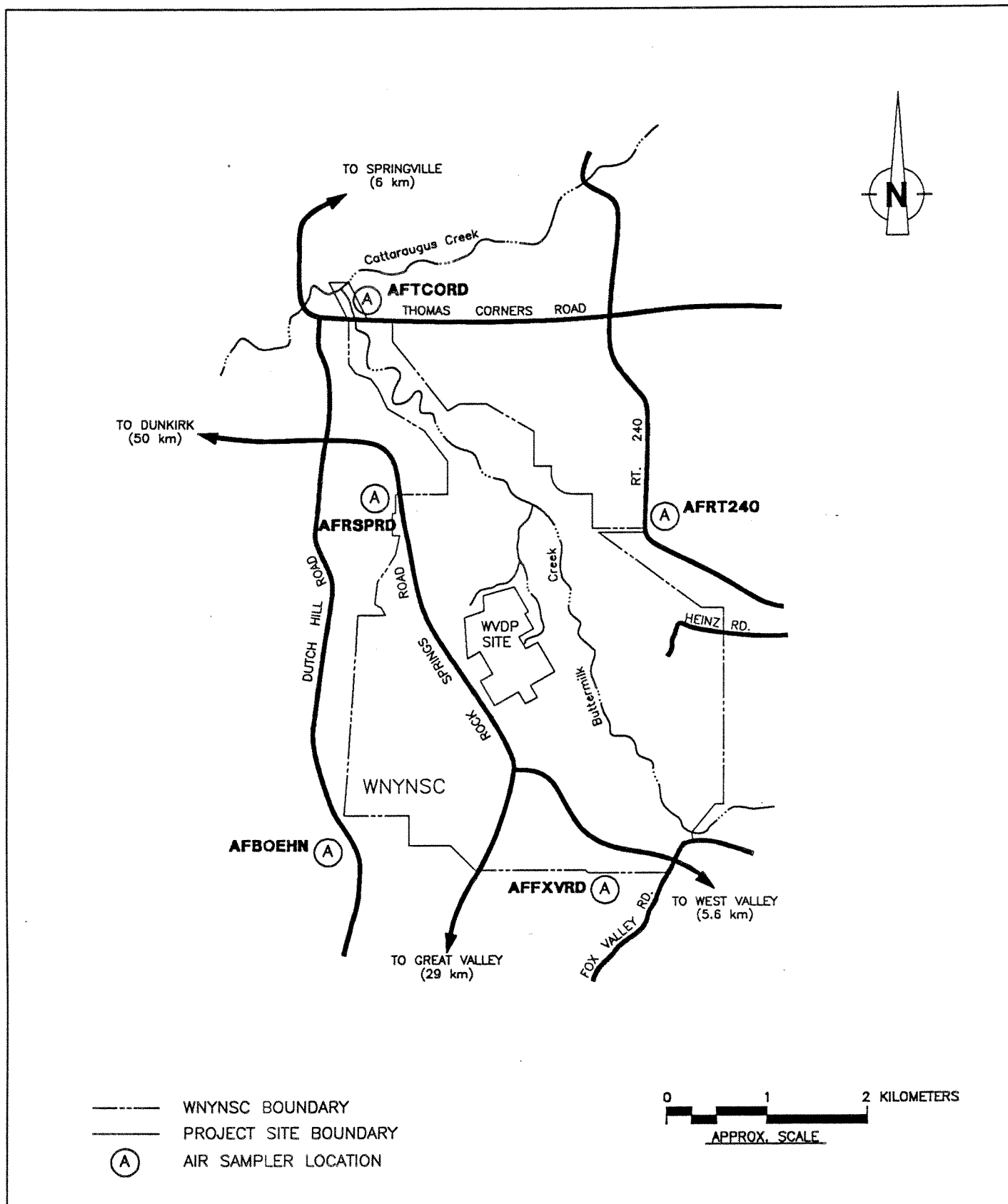


Figure A-6. Location of Perimeter Air Samplers.

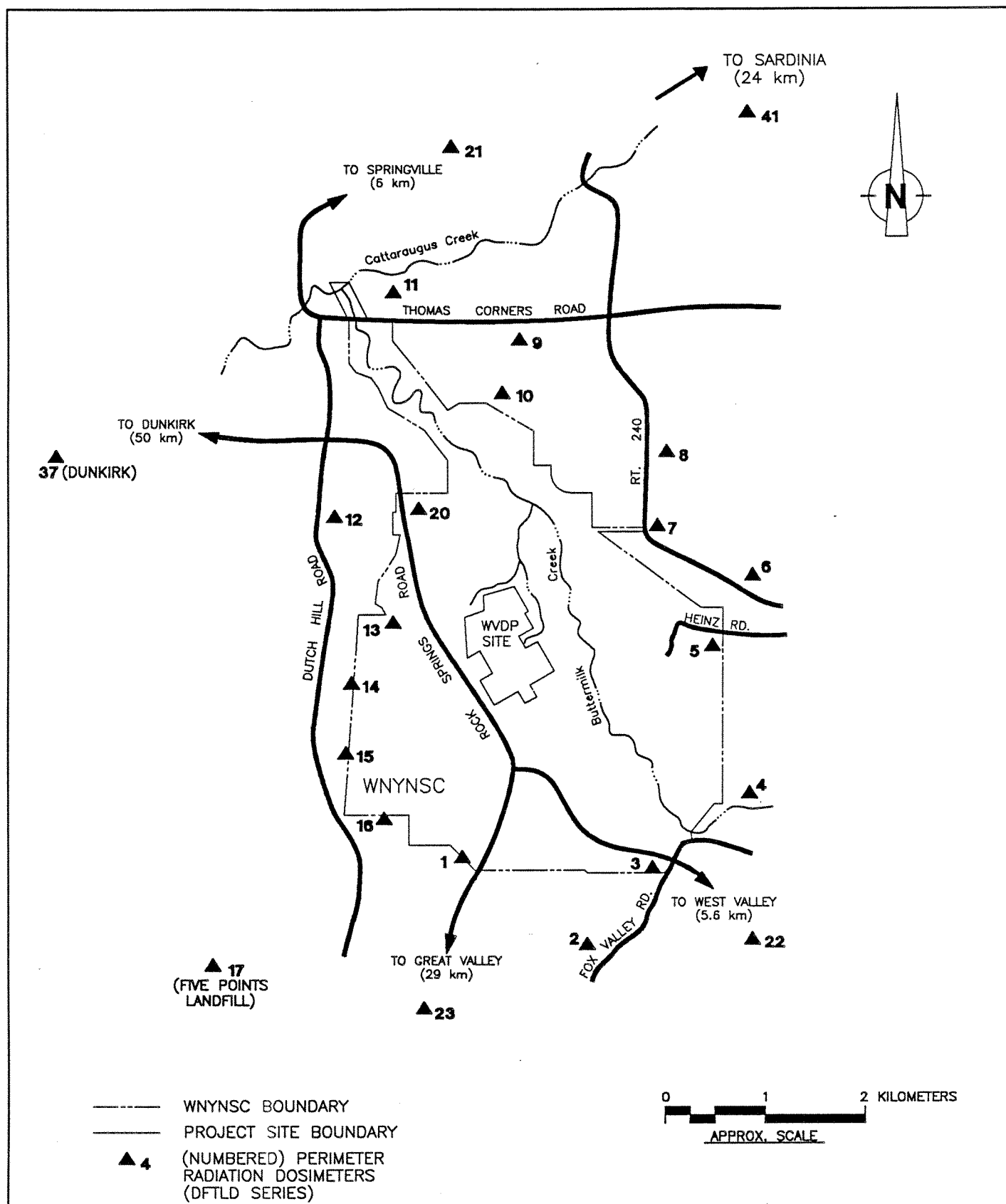
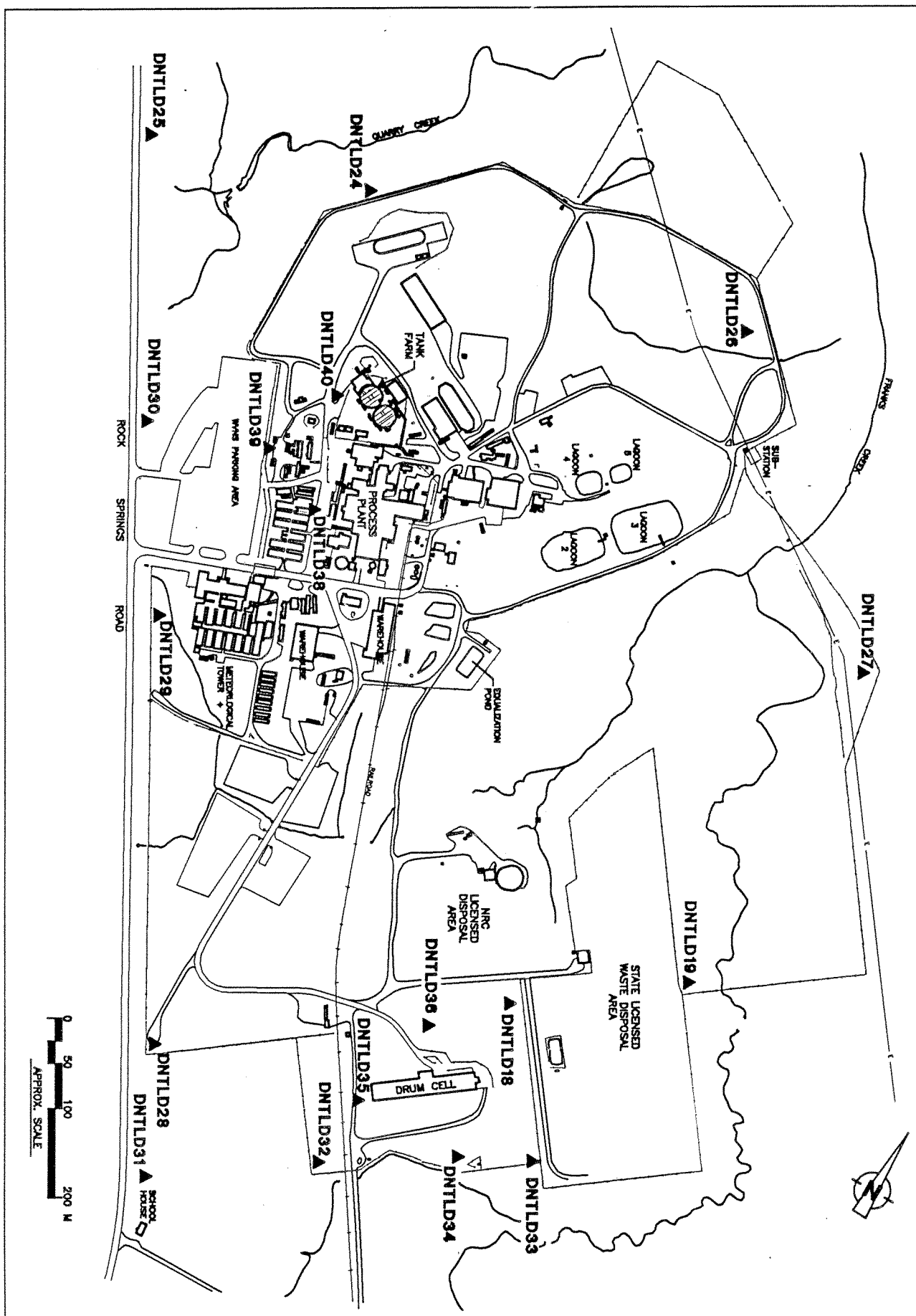
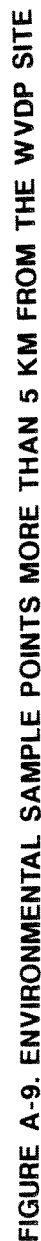


Figure A-7. Location of Off-Site Thermoluminescent Dosimetry (TLD).

Figure A-8. Location of On-Site Thermoluminescent Dosimetry (TLD).





REF: NYSDOT, New York State Map --- West Sheet,
1:250,000, Revised 1982

